

CONCEPTUAL STRATEGIES FROM THE WATER SUPPLY AND RELIABILITY STRATEGIC PLAN WORKGROUP

[AS PRESENTED TO THE DELTA VISION BLUE RIBBON TASK FORCE ON APRIL 24TH, 2008]

The following pages are a collection of conceptual strategies developed by the Water Work Group for improving water supply reliability in California.

These strategies fall into several categories:

- ◆ Improving Regional Self-Sufficiency
- ◆ Managing Diversions from the Delta Watershed to Minimize Impacts to Ecosystem Health
- ◆ New and Modified Facilities for Storage and Conveyance
- ◆ Applying the Reasonable Use the Public Trust Doctrine
- ◆ Cross cutting concepts (including reasonable use and public trust)
- ◆ Improving Water Quality for Diverted Uses

The strategies are further divided into (1) those that have been discussed by the work group and have a one-page description, and (2) those that are under consideration, for which only a “working title” is listed. Two tables are included to separate the conceptual strategies into these two categories. Following the tables is a set of one-page descriptions that are intended to capture the essence of the concepts that have been discussed.

These strategies may not necessarily be mutually compatible, and work group members have strong disagreements about some of them. Some of these concepts resulted in expected disagreements and debate during work group meetings, and there was not always a workable compromise. But, given the charge by the Task Force, including all of them seemed appropriate.

All of the conceptual strategies need further discussion and development, which the workgroup will continue to work on through its fifth and final meeting on April 29th.

Table 1 [updated as of 04-18-08]

Partially-Vetted Concept Strategies for "Water Supply for California"

[A set of 1-page summaries are available for this set of concepts that reflects partially vetting within the workgroup]

A. Improving Regional Self-Sufficiency

A.1 Universally Applicable Ideas

A.1.1	Improve collection of baseline water diversion and use data
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A.2 Increase the efficiency of agricultural and urban uses of diverted water supplies

A.2.1	Develop mechanisms to increase the implementation of urban water use efficiency measures
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A.2.2	Require new developments to include best-available water savings devices and to provide mitigation for new water use
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A.2.3	Increase the percentage of agricultural lands irrigated with highly efficient technology and management practices
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A.3 Increase the Availability of Locally Generated Water Supplies

A.3.1	Increase the use of recycled water
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A.4 Tools to Assist with Managing Inconsistency in the Reliability of Surface Water Supplies

A.4.1	Streamline the water transfer regulatory approval process
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A.4.2	Examine the legal and regulatory framework associated with groundwater banking agreements and operations
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B. Managing Diversions from the Delta Watershed to Minimize Impacts to Ecosystem Health

B.1.1	Enable Environmental Water Purchase Mechanisms and Institutions
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B.2.1	Protect the Delta by establishing minimum inflow and outflow requirements and limiting diversions during times when harmful to fisheries
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C. New and Modified Facilities for Storage and Conveyance

C.1 Additional surface and groundwater storage

C.1.1	Provide funding for federal procedural requirements to modify flood management operations at existing major multi-purpose surface storage facilities to allow reliance on forecasting methods and to obtain additional yield
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C.2 New Regional Conveyance Facilities (including improvement to conveyance through the Delta for export)

C.2.1	In the near-term, experimentally implement a Middle River conveyance as recommended by the Stakeholder Coordination Group
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D. Applying the Reasonable Use the Public Trust Doctrine

D.1	Increase SWRBC staff and augment authorities to aid monitoring and enforcement efforts associated with Delta Watershed diversions
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E. Cross-purpose Ideas

E.1	Investigate the Development of a Water Trust to acquire water for ecosystem management at little or no cost while advancing statewide conservation objectives and strengthening reasonable use constructs
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F. Improving Water Quality for Diverted Uses

F.1	Control contaminants at the source
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F.2	Use water management tools to protect and improve water quality
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Table 2 [updated as of 04-18-08]

Under-Development Concept Strategies for "Water Supply for California"

[This suite of draft concepts is very preliminary and has had little discussion within the workgroup to date]

A. Improving Regional Self-Sufficiency

A.1 Universally Applicable Ideas

A.1.2	Increased technical assistance and technology transfer
A.1.3	Increased public education regarding water supplies and use
A.1.4	Continued/increased public funding (grant/loan - tied to minimum performance metrics)

A.2 Increase the efficiency of agricultural and urban uses of diverted water supplies

A.2.4	Equalize water management planning and reporting requirements (CUWCC, DWR, USBR, Ag Council)
A.2.5	Require retail water purveyors to implement aggressive tiered pricing or similar mechanism [possibly also address managing impacts to purveyor budgets, meeting 218 requirements, and "temporary shortage condition" pricing]
A.2.6	Require UWMPs to address defined levels of uncertainty in water supplies imported from the Delta (add to UWMP Act) to recognize potential ranges of shortfalls from hydrologic and regulatory/judicial conditions
A.2.7	Combine land planning more extensively with water planning

A.3 Increase the Availability of Locally Generated Water Supplies

A.3.2	Increase the production and use of water from desalinated brackish ground and surface water and ocean water
A.3.3	Promote LID developments to capture/percolate/store local stormwater

A.4 Tools to Assist with Managing Inconsistency in the Reliability of Surface Water Supplies

A.4.3	Encourage local water purveyors to store water conserved from demand management to assist with managing for improved reliability for the conserving users
A.4.4	Promote further comprehensive basin management planning to address the availability, quality and managed use of regional groundwater resources
A.4.5	[tbd - watershed management]

B. Managing Diversions from the Delta Watershed to Minimize Impacts to Ecosystem Health

B.1 Facilities and Operations

B.1.2	Operational flexibility: reconcile needs for baseline standards and flexibility within current year and year-to-year [include increased diversion capacity at State and federal facilities]
B.1.3	Integrate CVP/SWP facilities and operations, especially Delta export operations under State management
B.1.4	Require all diversion facilities in the Delta Watershed, either in excess of ____ cfs or in locations identified as environmentally sensitive, to be screened by 2015
B.1.5	Improve forecasting/prediction/notification of potential diversion restrictions [esp. in the Delta]
B.1.6	Move major in-Delta diversion facilities to separate from areas of Ecosystem restoration, especially in areas where increased carbon and other constituents could adversely impact water quality for diverted purposes (e.g. North Bay Aqueduct and CCWD intakes)

B.2 Diversion Permits

B.2.2	[tbd - Incorporate concepts from the "hold harmless" concept being considered in the BDCP process]
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C. New and Modified Facilities for Storage and Conveyance

C.1 Additional surface and groundwater storage

C.1.2	Encourage the development of local/regional storage facilities and operational agreements
C.1.3	Develop storage requirements and operational guidelines to address the use of recycled water for indirect reuse
C.1.4	Expedite the completion of on-going CALFED-initiated surface storage investigations

C.2 New Regional Conveyance Facilities (including improvement to conveyance through the Delta for export)

C.2.2	Require clear decision process and public vetting of major modeling assumptions for the BDCP EIR/EIS for a Delta Conveyance Alternative
C.2.3	Require necessary decisions, permits, and funding mechanisms for the BDCP EIR/EIS preferred alternative within ____ years of completion of the draft DWR EIR/EIS for a Delta Conveyance Alternative
C.2.4	Identify mechanisms to "connect" legal water users to improved through Delta conveyance facilities including but not limited to Contra Costa Water District and legal users in the south and central Delta water agencies
C.2.5	Improve the efficiency of the state agency approval and environmental compliance/permitting processes for new conveyance facilities identified as necessary to facilitate regional self-sufficiency (e.g. to facilitate groundwater banking or

D. Applying the Reasonable Use the Public Trust Doctrine

D.2	Encourage the SWRCB to more aggressively use existing authorities to incorporate Delta Watershed Public Trust objectives into administration, governance and oversight of water rights
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E. Cross-purpose Ideas

E.2	Shift export diversion timing to wetter years while providing sufficient reliability for regions reliant on water exported from the Delta Watershed
E.3	Cap and Trade program
E.4	Increased investment in development of Delta hydrodynamic and system water management modeling tools

IMPROVING REGIONAL SELF SUFFICIENCY

A.1.1 Improve collection of baseline water diversion and use data

Objective:

1. Develop and use comprehensive information on the local, regional, and statewide availability, quality, use and management of groundwater and surface water resources to help improve opportunities for regional self-sufficiency.

Vision Recommendations:
4, 5, 6, 7

Methods:

- ◆ Install stream gauging stations at critical outflow points associated with DWR planning area boundaries to aid in DWR regional “water budgeting” used to help develop the California Water Plan.
- ◆ Improve local, regional and statewide collection and dissemination of agricultural land-use data to better represent crop water use and evapotranspiration changes on an annual basis for use in understanding regional trends.
- ◆ Department of Water Resources will continue to collect groundwater elevation data in all groundwater basins and subbasins in the Delta Watershed regularly and systematically, and make the resulting information readily and widely available. DWR should also expand its current network of monitoring wells, including groundwater elevation and groundwater quality monitoring wells, and continue to coordinate monitoring and understanding of data with local entities.
- ◆ Encourage local and regional agencies/individuals to submit relevant and timely information on surface and groundwater attributes to state agencies, such as DWR, to include in broader data repositories.
- ◆ Coordinate state data collection related to urban and agricultural water use and deliveries to facilitate use of data to measure progress meeting conservation targets.

Basis in the Vision:

- ◆ A more comprehensive understanding of water and land-use data in the Delta watershed would provide a better foundation for changes in water diversion timing and support efforts to become more regionally self-sufficient. Currently, several assumptions are made in planning and modeling exercises to represent surface and groundwater use characteristics. Such assumptions can, at times, lead to incorrect conclusions and actions.

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IMPROVING REGIONAL SELF-SUFFICIENCY

A.2.1 - Develop mechanisms to increase the implementation of urban water use efficiency measures

Objective:

1. Continue to have water use efficiency be a primary way to meet increased demand
2. Ensure the most effective use of water diverted from the Delta Watershed for urban uses

Vision Recommendations:
4, 6

Method:

- ◆ Strengthen the “loading order” currently in the Water Code
- ◆ Accelerate metering deadline from 2025 to 2020
- ◆ De-couple revenue generation from sales
- ◆ Require more aggressive tiered pricing
- ◆ Require local planning to address specific higher levels of uncertainty in supplies
- ◆ Improve coordination between land planning and water planning
- ◆ Require plumbing fixture replacement on resale
- ◆ Encourage reduction in connection fees for low-impact development
- ◆ Pursue more vigorous regulatory action against inefficient users/suppliers
- ◆ Establish a certification program for water supplier efficiency performance
- ◆ Expand educational programs

Basis in the Vision:

- ◆ Calls for greater conservation and demand management are included throughout the Vision document, most pointedly in recommendations 4 and 6.
- ◆ Governor Schwarzenegger has established a target of reducing California per capita water use 20% by 2020, and has directed state agencies to develop a more aggressive plan of conservation to achieve this target. State agencies are considering a range of programs and measures to reduce per capita water use, and expect to develop a recommended plan by the time the DVTF release its strategic plan in October.

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IMPROVING REGIONAL SELF-SUFFICIENCY

A.2.2 - Require new developments to include best-available water savings devices and to provide mitigation for new water use

Objective:

1. Ensure that Californians can meet water demands of both existing and new residents while adapting to climate change

Vision Recommendations:
4, 6

Methods:

- ◆ Through CEQA, require all new developments in California to incorporate cost effective and feasible water efficiency measures.
- ◆ Require new water consumption in the new development to be mitigated through a combination of water efficiency measures in existing communities and by development of capacity for highly reliable local water supplies.
 - A portion of the water mitigation programs will be directed to disadvantaged communities that otherwise would not be able to afford efficiency and adaptation
- ◆ Urge all new residential and commercial development of a certain size in California to install dual plumbing (i.e. purple pipe).
- ◆ Require all new residential and commercial development to show that its water supplies are sustainably attained and will not result in additional depletions from California rivers and streams.

Basis in the Vision:

- ◆ To help achieve regional self-sufficiency objectives of the Vision, many new developments necessary to meet the anticipated future population of California will need to undertake a new paradigm with regard to the type of products offered, such that water use – especially outdoor use – is minimized or met with climate resilient supplies.
- ◆ Disadvantaged communities already struggle with failing water systems and do not have the resources to make repairs or to install best-available water fixtures and devices. This strategy would help them reach necessary improvements in water use efficiency.

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IMPROVING REGIONAL SELF SUFFICIENCY

A.2.3 - Increase the percentage of agricultural lands irrigated with highly efficient technology and management practices

Objective:

1. Incentivize the adoption of highly efficiency irrigation management and technology to improve on-farm application efficiency and reduce surface water degradation from runoff

Vision Recommendations:
1, 4, 6, 9

Methods:

- Increase the funding available and streamline the procedural requirements for very-low interest loans and/or grants for the installation of state-of-the-art drip or micro irrigation systems or other equipment and methods that eliminate any return flows to surface water systems.
- Pursue exemption for individual irrigators from regulations under the various RWQCB irrigated lands runoff programs upon installation and maintenance of state-of-the-art drip or micro irrigation systems or other equipment and methods that eliminate any return flows to surface water systems. Rationale for exemptions would adapt over time as understanding of relationships between irrigation methods and degradation to surface and groundwater resources is improved.

Basis in the Vision:

- Several Regional Water Quality Control Boards, including the Central Coast, Central Valley, Los Angeles and Lahontan Boards, have implemented regulatory programs aimed at reducing contamination of surface waters of the state by runoff from agricultural fields. Well managed irrigation systems are the best defense against runoff. In particular, so-called drip or low volume irrigation systems are widely acknowledged as being efficient at reducing or eliminating runoff and thus reducing unit applied water volumes.
- Installation and maintenance of drip irrigation systems represents a significant investment in efficiency by a grower. Drip systems are currently the state-of-the-art for irrigation systems. Compared to sprinkler, row or border systems, they produce little or no runoff and represent de minimus risk of contamination to surface waters.
- The state can encourage greater rates of implementation of drip systems by exempting growers from regulations under the various irrigated lands runoff programs.

Potential Impediments:

- The RWQCBs view both groundwater and surface water as “waters of the state” and therefore are considering requiring even irrigation methods that do not result in return flows to surface water bodies to comply with irrigation lands runoff program requirements. The thought is that drip and micro-systems can still result in the introduction of undesired constituents into an aquifer system as a result of deep percolation of applied water.
- Improved efficiencies can have an indirect impact to groundwater recharge benefits

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IMPROVING REGIONAL SELF-SUFFICIENCY

A.3.1 - Increase Use of Recycled Water

Objective:

1. Increase production of high-quality recycled water from existing and anticipated municipal wastewater flows
2. Maximize the use for landscape irrigation and other non-potable uses, including indirect uses including groundwater recharge

Vision Recommendations:

4, 6

Methods:

- Require dual plumbing with “offset” credits to developments in SB 610 assessments (where recycled water delivery is practical and/or planned)
- Enact more stringent treatment standards on wastewater treatment dischargers
- Improve acceptability of practices through public education
- Address DHS and RWQCB permitting conditions to promote consistent, fully protective measures
- Provide tax incentives to promote use of recycled water
- Revise water management legislation, such as the Urban Water Management Planning Act and SB 610, to require coordination between water purveyors and wastewater agencies
- Encourage pilot projects for indirect reuse opportunities, including addressing the need and operational requirements of related storage infrastructure.
- Require salinity management plans to be prepared for groundwater basins using or planning to use significant recycled water resources.

Basis in the Vision:

- Tertiary treatment of wastewater is required before treated municipal wastewater can be used. Requiring more municipal treatment plants to treat wastewater to tertiary standards would increase the quantity of treated wastewater available for landscape irrigation and other non-potable uses.
- There is a perception by some that treated municipal wastewater is not safe for landscape irrigation in parks, schools, and yards. This can result in public pressure on local governments to restrict plans to optimize its use. Increasing public awareness of the quality and safety of treated wastewater would improve the public’s perception of this resource.
- Permitting requirements often discourage use of treated wastewater because they are inconsistent or overly protective. Differing treatment standards for recycled water that is used for groundwater recharge through percolation and water that is recharged through use of injection wells is but one example of inconsistent requirements. Relaxing some requirements on the use of treated wastewater such as runoff and temporal limitations would also promote increased utilization of treated wastewater.
- State and local tax incentives could help offset the infrastructure, permitting, and reporting costs associated with the use of municipal treated wastewater.

Potential Impediments:

- Salinity management issues can limit how and where recycled water can be used.

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IMPROVING REGIONAL SELF-SUFFICIENCY

A.4.1 - Streamline the water transfer regulatory approval process

Objective:

Have a more robust and effective short-term water transfer market to help water users manage water supply uncertainties.

Vision Recommendations:
1, 4, 6, 8

Methods:

- Standardize legal and regulatory requirements for short-term water transfers including consistent rules defining the determination of transferrable water, streamlined CEQA and NEPA compliance, and pre-defined mitigation options.
- Create permanent interagency team that incorporates direct and substantial participation from potential buyers and sellers to provide one-stop shopping for transfers. The team would develop rules and procedures well in advance, and get that material out to all potential sellers and buyers along with contact information, time line estimates for different types of transfers, etc. This needs to be a permanent arrangement, not something put together ad hoc in the middle of a drought.
- Give institutional priority to the facilitation of water transfers.
- Control agencies, such as DWR, should provide clear information to transfer proponents well in advance of typical transfer seasons, specifying the information about the transfer that will be needed, when the information will be needed, points of contact within the agencies, etc. As soon as possible during the water year, DWR and Reclamation should provide estimates of their ability to conduct cross-Delta transfers including timing and amounts.
- Establish an entity(ies) (public and/or private, but likely other than a State agency) to oversee a pool of water supply options by working through regulatory and procedural steps that would allow willing sellers to obtain pre-approval for defined water transfers
 - a. Modify water transfer procedures established in the California Water Code and as administered by the SWRCB and DWR to facilitate pre-approval considerations.

Basis in the Vision:

- Current procedural requirements, even to execute a seemingly simple water transfer transaction, can be complicated by several months of procedural steps. These steps can adversely impact the ability to complete environmentally, economically, and socially sound transfers in reasonable timeframes.
- Complicated and costly transactional procedures are impediments to some parties who might otherwise be willing to make water available for temporary transfer. An option pool that allows conditional pre-approval would allow all parties equal access to make water available to transfer.
- Creating a pool of potential sellers of water, well in advance of a water supply crisis, could be an orderly approach to reducing uncertainty for those in need and maximizing predictability for those who may wish to consider intermittent sales of water.
- California's water resources should be put to use to the fullest possible extent, as required by article X, section 2 of the California Constitution.

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IMPROVING REGIONAL SELF-SUFFICIENCY

A.4.2 - Examine the legal and regulatory framework associated with groundwater banking agreements and operations

Objective:

1. Clarify and otherwise make consistent (as practical) the legal and regulatory framework that governs the intentional placement, storage and extraction of surface water into groundwater aquifers.

Vision Recommendations:
4, 6, 8

Methods:

- Facilitate banking, extraction, and delivery of State and local water supplies through revisions of place-of-use restrictions
- Exempt extractions and deliveries of banked groundwater from county ordinances that require permits for out-of-county exports of groundwater
- Work with the U.S. Bureau of Reclamation to facilitate flexible groundwater banking, extraction, and delivery operations
- Encourage technological advances in groundwater banking methods
- Require SWRCB to adopt statewide guidelines regarding the permitting of Aquifer Storage and Recovery operations
- Expedite grants and loans for the purchase of high-valued lands for groundwater banking to prevent urbanization of said lands

Basis in the Vision:

- Extraction and delivery of banked groundwater can be extremely complicated because of regulatory and contractual limitations. Removing limitations on the extraction and delivery of banked groundwater would enhance water supply reliability and expand state-wide storage capacities.
- Use of advanced technologies, such as aquifer storage and recovery (ASR) projects, would increase the ability to store surface water. Alternative methods would enhance the ability to store water during winter months when more surface water and conveyance capacity are available but groundwater storage through conventional spreading operations is limited because of soil conditions, and in urban areas where land for recharge is often in short supply.
- A program whereby the State, working with local agencies, purchases high-valued lands for banking operations with the expectation that the purchase price would be repaid from revenues once local agencies develop the banking project would expand water banking.

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MANAGING DIVERSIONS FROM THE DELTA WATERSHED

B.1.1 - Enable Environmental Water Purchase Mechanisms and Institutions

Objective:

1. Provide an additional tool to create water assets for environmental purposes.

Vision Recommendations:
1, 3, 6, 7, 9

Methods:

- Create an endowed fund to purchase water and water rights to apply above a regulatory baseline to provide additional water supply for environmental needs on a real-time basis.
- A water endowment fund could be created through a bond issue or private funding, or combinations of both. An endowment fund could be supplemented by a water use fee levied on all water use in an affected watershed. Water purchases could be for permanent water rights, option transfers or spot market purchases using a portfolio approach.
- The water endowment could be managed by a Delta Conservancy that would manage habitat restoration projects and move water to enhance the environment generally and to support restoration actions specifically.

Basis in the Vision:

- Water purchases for the environment have a number of advantages in supplementing a regulatory baseline. One, they are more flexible, allowing variable decision making based on annual or seasonal circumstance. Two, they can be more effective, targeting specific improvements in time and location. Three, they can be traded inter-annually, allowing more investment in a given year with savings held from a prior year. Four, they can be implemented more rapidly than through regulatory mechanisms which take years to implement, are less certain and subject to litigation. Five, they can be funded by a mix of private and public resources.
- For example, a \$100 million endowment invested returning an 8% rate of return under a non-profit organization status would allow for an annual purchase of 160,000 AF in wetter years (\$50 AF) or about 40,000 AF in dry years (\$200 AF). Funds could also be used to purchase permanent water rights. \$2.39 million per year could buy 100,000 AF of water from a source at \$4,000 per AF of permanent right, amortized at 6% for a thirty year bond, the end of which the right would be permanent and paid for. These are examples for scale only and the size of endowment needed is not implied.
- Efforts to reduce the impact of one of the stressors on the Delta ecosystem – the diversion of water – are currently limited to regulatory and legal mechanisms (e.g. the courts). Adding tools to facilitate adaptive management to achieve flow regimes that are still-developing provides the ecosystem managers with a way to “buy-down” diversions under certain circumstances. This flexibility would help advance the scientific understanding of what is needed to achieve ecosystem goals while potentially working through other mechanism to permanently acquire water supplies.
- The tool is a supplemental one with limits. Another large player in the water market would drive up prices for a limited resource, especially in dry years. However, in average or above average years, purchases would buy more water due to less competition and a Conservancy could work with storage managers to convert wet year water to dry year water

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MANAGING DIVERSIONS FROM THE DELTA WATERSHED

B.2.1 - Protect the Delta by establishing minimum inflow and outflow requirements and limiting diversions during times when harmful to fisheries

Objective:

1. To revive a healthy, self-sustaining ecosystem that is able to support multiple functions, including water supply.

Vision Recommendations:
3, 5, 7

Methods:

- Limit Delta diversions by establishing minimum in-stream flow and Delta outflow requirements that ensure that basic ecosystem functions can be restored and maintained to support viable populations of fisheries resources. Flow requirements may impact diversions upstream of the Delta, as well as in-Delta diversions and exports. As the scope of the Delta Vision is broad, it should consider the effects that all upstream diversions, not simply those of the State and federal projects.
- The flow requirements and performance measures should be based on the ecosystem objectives that are being developed in other work groups.
- Management of water projects should be able to adapt to changing conditions, new science and potential new infrastructure. Accordingly, flexibility in management should be built into operating rules. Those rules should be applied by fishery agencies with vigorous public oversight.

Basis in the Vision:

- In the Delta and its watershed, multiple scientific research efforts have documented the significant relationships exist between flow and ecosystem performance measures, such as fish abundance. Once ecosystem recovery targets are defined, these relationships can be used to determine the flow levels necessary to meet those objectives. These minimum flows may be increased to reflect improved scientific understanding, but may only be decreased after a defined improvement in performance measures has been demonstrated. This conservative approach ensures that actual, rather than predicted, ecosystem improvement will be achieved before increased diversions are permitted.
- Flow is one of the key drivers of aquatic ecosystem health.

Potential Impediments:

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NEW AND MODIFIED STORAGE AND CONVEYANCE

C.1.1 - Provide funding for federal procedural requirements to modify flood management operations at existing major multi-purpose surface storage facilities to allow reliance on forecasting methods and to obtain additional yield

Objective:

1. Modernize flood management operations at major multi-purpose surface storage reservoirs to obtain water supply benefits while maintaining or increasing flood protection.

Vision Recommendations:
6, 8

Methods:

- ◆ Modernize flood control operation diagrams for all major California reservoirs for which the Corps has prescribed flood control regulations. The modernization would account for the current technology advances and the hydrologic changes that have occurred and changes that are likely to occur because of climate change.
- ◆ As a minimum, the operations criteria should be based on forecasts and not be based on existing reservoir storage.
- ◆ Funding required: \$2 million annual funding for ten years for the Corps for both the update of the operations criteria and manuals and the environmental documentation (EIS) that may be required to accomplish the changes in operation. Following the initial 10 year modernization period, an annual Corps funding level of about \$500,000 would assure the operations of these reservoirs stays up to date.

Basis in the Vision:

- ◆ The major problem with the flood control criteria is that it does not distinguish between large floods, small floods and no floods. It only focuses on the current storage in the reservoir and not on the threat of flooding. This frustrates the optimization of the operation for water supply and other uses without improving flood protection. Conversely when storage is not in the allocated flood space, no flood releases are called for even when a major storm approaches California from the Pacific Ocean.
- ◆ Normally these activities are funded out of the Corps O&M budget. This has been a problem in the past because any new stipulated work to be done has had the effect of limiting funds for normal maintenance. The modernization work should be stipulated as a separate line item that would not affect the normal maintenance of the projects in order to assure the funds will meet the intended purpose.

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NEW AND MODIFIED STORAGE AND CONVEYANCE

C.2.1 - In the near-term, experimentally implement a Middle River conveyance as recommended by the Stakeholder Coordination Group

Objective:

1. To improve water supply reliability in the near-term, before a permanent Delta conveyance solution is achieved, and to generate knowledge important to that solution..

Vision Recommendations:

6, 8

- ◆ This would convey water intended for export from the Sacramento River to the Clifton Court Forebay by routing it through the Delta Cross-Channel, the Mokelumne River, the Middle River fork of the San Joaquin, and Victoria Canal.
- ◆ Victoria Canal would then be siphoned under Old River, and the sloughs connecting Old River and Middle River would be fitted with operable barriers. This hydraulic separation of Middle and Old Rivers – if proven to work as envisioned – would allow Old River to be managed for aquatic habitat without suffering from pumping impacts or compromising the quality of export water in Middle River. In addition, the entrance to the Delta Cross-Channel (and perhaps other locations) would be fitted with fish screens to minimize or eliminate entrainment of fish.
- ◆ If no fatal flaws are identified, obtain permits and ground-test the components of a Middle River Conveyance option, initially as a reversible experiment. In an open, transparent manner, analyze and refine the Middle River Conveyance option, including evaluation and appropriately staged implementation of fish screens, gates and other “testable” components.
- ◆ Develop performance standards that will be applicable to any conveyance option, including ecosystem, water supply, environmental justice, water quality, and fish populations.
- ◆ The analyses should include a siphon to separate Old and Middle Rivers, under varying water operations and flows. Conduct real-time monitoring, testing the components under varying flow conditions. At the end of each year, assess whether it should be continued as an experiment and maintain the ability to modify the design. If unacceptable impacts occur (based on the performance measures developed), stop the experiment and consider alterations for further testing. If results indicate the Middle River Conveyance is not likely to achieve its stated objectives, other potential through-Delta conveyance options should be similarly tested..

Basis in the Vision:

- ◆ The Vision identifies a reliable water supply for California as one of the co-equal values, and identifies dual conveyance as a “preferred direction” for analysis of a permanent conveyance solution. However, it is likely that such a solution will take several years, at least, to design, study, and build. In the meantime, the Middle River conveyance experiment described above could support the co-equal values by improving water supply reliability and protecting fish species.
- ◆ In addition, the Vision also calls for “Improvements in the current water conveyance” as one of the seven near-term actions (p. 48 of the Vision), and states that such improvements should be improved as rapidly as possible.

Potential impediments

The performance of the conveyance will have to be studied carefully to ensure it achieves its goals.

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APPLYING THE REASONABLE USE AND PUBLIC TRUST DOCTRINES

D.1 - Increase SWRCB staff and augment authorities to aid monitoring and enforcement efforts associated with Delta Watershed diversions

Objective:

1. Increase the existing SWRCB monitoring and enforcement mechanisms and resources to ensure that water users upstream, within and exporting from the Delta are only taking water to which they are legally allowed.
2. Augment the existing SWRCB authorities to improved monitoring and enforcement.

Vision Recommendations:
1, 5

Methods:

- Provide secure annual funding for 20 additional positions at the State Water Board tasked with investigating water rights compliance, illegal diversions and waste and unreasonable use within the Delta Watershed
- Modify statutes that authorize the SWRCB to include: (1) clear authority for the State Water Board to require monitoring by all water diverters, including those within the Delta currently not required to report diversions, (2) authorize monetary penalties for monitoring and reporting violations, (3) have adequate penalties for unauthorized diversions and violations of cease and desist orders, and (4) have provisions for interim relief
- The SWRCB should consider requiring the development of an integrated SCADA¹ data network for most of the permitted and licensed diversions to provide real-time information into a database linked to water rights licenses. License data relative to allowable volume and term of diversion could be entered into the database and software could be written to flag excess diversions beyond permit terms. Automated flagging of diversions in excess of amounts could allow for efficient use of enforcement resources.

Basis in the Vision:

- The State Water Board currently limited staff for water rights enforcement activities for the entire State. Additional staff (20 +/-) would help with effective water right administration.
- Currently the State Water Board does not have sufficient authority to effectively monitor and enforce water rights laws and to meet its responsibilities. Appropriate enforcement and monitoring tools are increasingly important as California faces critical water supply shortages and conflicts between water diversions and public trust issues.

Potential Impediments:

Water Right fee payers are very critical of funding Water Right activities for which they do not see a direct benefit. Fee payers will likely oppose any substantial increase in enforcement costs, unless the support is provided by the General Fund or an alternative funding source.

¹ **SCADA** is the acronym for *Supervisory Control And Data Acquisition*. SCADA systems are typically used to perform data collection and control at the supervisory level. Some systems are called SCADA despite only performing data acquisition and not control. Varying levels of automation are incorporated in SCADA system design.

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CROSS-TOPIC STRATEGIES

E.1 – Investigate the Development of a Water Trust to acquire water for ecosystem management at little or no cost while advancing statewide conservation objectives and strengthening reasonable use constructs

Objective:

1. Create regulatory incentives for water users to place water assets into a Water Trust that would manage the supplies for Delta watershed ecosystem management objectives as a supplement to regulatory standards.
2. Optimize statewide conservation and reasonable use objectives by maximizing water use efficiency, reducing water quality degradation, and protecting long-term water assets.
3. Create market incentives for water conservation improvements above macro-level standards.

***Vision Recommendations:
1, 3, 4, 5, 6, 7, 9, 12***

Methods:

- Modify Water Code to recognize water assets placed in the Water Trust as a beneficial use.
- Require water assets to be available for Water Trust purposes for long periods of time – at least 10 years – before assets are again available to the asset provider.
- Establish macro-level standards for reasonable use associated with (1) the delivery and application of water supplies and (2) the degradation of surface water bodies from return flows that would be used by the SWRCB to identify reasonable use associated with irrigation practices.
- Increase resources to the SWRCB to allow for increased enforcement of reasonable use.
- Establish an entity to manage the Water Trust assets for Delta ecosystem purposes.
- Streamline grant and loan programs to aid in the implementation of equipment and practices to improve conservation efforts and effectiveness.
- Develop incentives for water conservation beyond the macro-level reasonable use standards by streamlining water transfers for those with existing assets in the Water Trust.
- Create a “water endowment fund” for the purchase of water supplies to meet ecosystem objectives (funded through diversion fees and public/private investments) that would begin to fully function upon the expiration of assets given to the Water Trust.

Basis in the Vision:

- Using the Public Trust Doctrine to attempt to reallocate water rights from current water rights holders to provide ecosystem water supplies will be (a) highly controversial, (b) difficult to achieve (due to limitations in scientific understanding); and (c) may adversely impact environmental systems (i.e. a court may strengthen the existing water rights system).
- Widespread regulatory enforcement of reasonable use principles is difficult to achieve. This concept preserves reasonable use authorities but reduces the number of reasonable use enforcement activities with strong conservation incentives (i.e. water asset preservation).
- A flexible system that re-enforces the SWRCB’s authority to identify unreasonable use by establishing macro-level standards for reasonable use allows for a new conservation ethic to be universally applied
- Protecting existing water rights can allow holders to have flexibility in future beneficial uses of water by not layering on today’s beneficial use as the standard (e.g. the future Silicon Valley could be in Williams).

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IMPROVING WATER QUALITY FOR DIVERTED USES

F.1 - Control Contaminants at the Source

Given current trends of population growth and climate change, Delta water quality will be degraded and the Delta will no longer consistently provide a reliable supply unless steps are taken to further protect water quality.

Vision Recommendations:
1, 6, 9

The Central Valley Regional Water Quality Control Board (Regional Water Board) is charged with protecting the beneficial uses in the Delta watershed; however water quality objectives have not been established for several key drinking water quality contaminants (organic carbon, nutrients, and pathogens). Existing source control methods will not be adequate to protect water quality as the population increases. Preventing contaminants from entering waterways will be the most efficient and sustainable strategy to protect Delta water quality for drinking water uses.

Methods:

- ◆ Water Quality Objectives – Direct the Regional Water Board to develop water quality objectives for organic carbon, nutrients, and pathogens.
- ◆ Emerging Contaminants - Develop a regulatory approach that can expeditiously address emerging contaminant problems as they are identified.
- ◆ Wastewater Treatment - Implement advanced treatment at all wastewater treatment plants discharging to Delta source waters and implement source control programs for their service areas.
- ◆ Urban Runoff - Control and treat runoff from urban areas. Focus on dry weather and first flush storm flows.
- ◆ Agricultural Discharges - Implement best management practices (BMPs) identified through the Regional Water Board's Irrigated Lands Program, to reduce pesticides and other contaminant loads.
- ◆ Confined Animal Feeding Operations - Implement BMPs for animal agricultural operations including Confined Animal Feeding Operations.
- ◆ Improved Enforcement – Provide adequate staff to the Regional Water Quality Control Board to improve inspections and enforcement of water quality regulations.
- ◆ Land Use Planning - Develop land use planning policies that ensure adequate protection of waterways from non-point source contamination. For example, policies may include mandatory buffer areas between urban or agricultural development and waterways to allow percolation and natural treatment of run-off.

Basis in the Vision:

Once water is contaminated, some constituents cannot be removed with current technology or without great expense, rendering the water unusable. Therefore, improving source water protection would enhance the available water supply by increasing the total amount of water available for beneficial use. This supports the reliable water supply component of Vision Recommendation 1, which emphasizes the co-equal Delta goals of a healthy ecosystem and a reliable water supply.

The Vision also states that the goals of conservation, efficiency, and sustainable use must drive California water policies (Recommendation 6). Once water is contaminated, significant energy is required to treat water, increasing the cost of providing clean drinking water to the public. Maintaining clean water throughout the water cycle and preventing water from becoming contaminated in the first place promotes sustainable and efficient water use practices by saving energy.

The Vision recommends that strategic investments be made in the Delta to improve water circulation and quality (Recommendation 9). One way to improve Delta water quality is to protect the quality of Delta source waters. To do so, wastewater from municipal and agricultural operations upstream of the Delta from both point and non-point sources must be thoroughly treated. Strategic investments are required to upgrade some wastewater treatment facilities both upstream and within the Delta to improve Delta water quality.

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IMPROVING WATER QUALITY FOR DIVERTED USES

F.2 - Use Water Management Tools to Protect and Improve Water Quality

Given projected climate change and sea level rise, Delta water quality for drinking water and agricultural uses will be degraded and the Delta will no longer provide a reliable supply unless steps are taken to protect and improve water quality. Tidal influences result in salt water mixing with fresh drinking and agricultural water supplies in the Delta. High salinity water results in salt accumulation in soils and groundwater, restricts recycling and groundwater recharge options and is expensive to treat. Bromide, present in seawater, reacts with disinfectants used in water treatment plants to form harmful disinfection byproducts (DBPs).

***Vision Recommendations:
1, 6, 9***

The Delta ecosystem restoration program will likely include tidal marsh restoration. Tidal marshes produce significant amounts of organic carbon. Organic carbon reacts with disinfectants to form DBPs, some of which are known carcinogens.

Methods:

- ◆ Interim Measures - Implement interim measures such as relocating Delta water intakes to access higher quality source water, or constructing barriers in the north, central, or south Delta to control seawater intrusion during critical times.
- ◆ Capture High Quality Water – To the extent feasible, without sacrificing reliability, modify operations to capture more drinking water during periods when salinity and organic carbon are lowest.
- ◆ Long Term Solution - Investigate a dual Delta conveyance system as a long term solution.
- ◆ New Facilities - Construct conveyance and storage facilities to collect high quality water when it is available.

Basis in the Vision:

Naturally occurring contaminants can only be managed, not prevented. A healthy ecosystem needs the naturally occurring compounds, creating a conflict with drinking water when the source of drinking water is an estuary. The best means of ensuring a supply of high quality water is to capture it during times when it is available, and at locations not impacted by the natural contaminants. Reliability is addressed by having the physical means to convey and store the available quantities of high quality water.

Water only counts as supply when its quality is adequate for its intended purpose. Water that is too high in organic carbon (from the estuary or floodplains) or salinity and bromide (from seawater) to produce safe drinking water is not a reliable supply. Water that is too high in salinity to be used for agricultural irrigation is not a reliable supply.

Capturing high quality water when it is available (from an ecosystem perspective) is consistent with Vision Recommendation 1, which emphasizes the co-equal Delta goals of a healthy ecosystem and a reliable water supply.

The Vision also states that the goals of conservation, efficiency, and sustainable use must drive California water policies (Recommendation 6). When Delta supplies are highly saline, regional groundwater recharge and recycling projects are limited, thus reducing regional self-sufficiency.

The Vision recommends that strategic investments be made in the Delta to improve water circulation and quality (Recommendation 9). Constructing conveyance and storage facilities, of a size and at locations to capture high quality available flows, are consistent with this recommendation.

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